

## Environmental Protection Agency

## § 98.53

CO<sub>2</sub> emissions is optional only for the 2010 reporting year pursuant to § 98.3(c)(12) and required every year thereafter.

[75 FR 79155, Dec. 17, 2010]

### § 98.44 Monitoring and QA/QC requirements.

Follow the applicable quality assurance procedures for CO<sub>2</sub> emissions in appendices B, D, and G to 40 CFR part 75.

### § 98.45 Procedures for estimating missing data.

Follow the applicable missing data substitution procedures in 40 CFR part 75 for CO<sub>2</sub> concentration, stack gas flow rate, fuel flow rate, high heating value, and fuel carbon content.

### § 98.46 Data reporting requirements.

The annual report shall comply with the data reporting requirements specified in § 98.36(d)(1).

[75 FR 79155, Dec. 17, 2010]

### § 98.47 Records that must be retained.

You shall comply with the recordkeeping requirements of §§ 98.3(g) and 98.37. Records retained under § 75.57(h) of this chapter for missing data events satisfy the recordkeeping requirements of § 98.3(g)(4) for those same events.

[75 FR 79155, Dec. 17, 2010]

### § 98.48 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

## Subpart E—Adipic Acid Production

### § 98.50 Definition of source category.

The adipic acid production source category consists of all adipic acid production facilities that use oxidation to produce adipic acid.

### § 98.51 Reporting threshold.

You must report GHG emissions under this subpart if your facility contains an adipic acid production process and the facility meets the requirements of either § 98.2(a)(1) or (2).

### § 98.52 GHGs to report.

(a) You must report N<sub>2</sub>O process emissions at the facility level.

(b) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from each stationary combustion unit following the requirements of subpart C.

### § 98.53 Calculating GHG emissions.

(a) You must determine annual N<sub>2</sub>O emissions from adipic acid production according to paragraphs (a)(1) or (2) of this section.

(1) Use a site-specific emission factor and production data according to paragraphs (b) through (i) of this section.

(2) Request Administrator approval for an alternative method of determining N<sub>2</sub>O emissions according to paragraphs (a)(2)(i) and (ii) of this section.

(i) You must submit the request within 45 days following promulgation of this subpart or within the first 30 days of each subsequent reporting year.

(ii) If the Administrator does not approve your requested alternative method within 150 days of the end of the reporting year, you must determine the N<sub>2</sub>O emissions for the current reporting period using the procedures specified in paragraphs (b) through (h) of this section.

(b) You must conduct an annual performance test according to paragraphs (b)(1) through (3) of this section.

(1) You must conduct the test on the vent stream from the nitric acid oxidation step of the process, referred to as the test point, according to the methods specified in § 98.54(b) through (f). If multiple adipic acid production units exhaust to a common abatement technology and/or emission point, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when multiple processes are operating and base the site-specific emission factor on the combined production rate of the multiple adipic acid production units.

(2) You must conduct the performance test under normal process operating conditions.

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(3) You must measure the adipic acid production rate during the test and calculate the production rate for the test period in metric tons per hour.

(c) Using the results of the performance test in paragraph (b) of this section, you must calculate an emission factor for each adipic acid unit according to Equation E-1 of this section:

$$EF_{N_2O,z} = \frac{\sum_{i=1}^n \frac{C_{N_2O} * 1.14 \times 10^{-7} * Q}{P}}{n} \quad (\text{Eq. E-1})$$

Where:

$EF_{N_2O,z}$  = Average facility-specific  $N_2O$  emission factor for each adipic acid production unit “z” (lb  $N_2O$ /ton adipic acid produced).

$C_{N_2O}$  =  $N_2O$  concentration per test run during the performance test (ppm  $N_2O$ ).

$1.14 \times 10^{-7}$  = Conversion factor (lb/dscf-ppm  $N_2O$ ).

$Q$  = Volumetric flow rate of effluent gas per test run during the performance test (dscf/hr).

$P$  = Production rate per test run during the performance test (tons adipic acid produced/hr).

$n$  = Number of test runs.

(d) If any  $N_2O$  abatement technology “N” is located after your test point, you must determine the destruction efficiency according to paragraphs (d)(1), (2), or (3) of this section.

(1) Use the manufacturer’s specified destruction efficiency.

(2) Estimate the destruction efficiency through process knowledge. Examples of information that could constitute process knowledge include calculations based on material balances, process stoichiometry, or previous test results provided the results are still relevant to the current vent stream conditions. You must document how process knowledge was used to determine the destruction efficiency.

(3) Calculate the destruction efficiency by conducting an additional performance test on the vent stream following the  $N_2O$  abatement technology.

(e) If any  $N_2O$  abatement technology “N” is located after your test point, you must determine the annual

amount of adipic acid produced while  $N_2O$  abatement technology “N” is operating according to § 98.54(f). Then you must calculate the abatement factor for  $N_2O$  abatement technology “N” according to Equation E-2 of this section.

$$AF_N = \frac{P_{a,N}}{P_z} \quad (\text{Eq. E-2})$$

Where:

$AF_N$  = Abatement utilization factor of  $N_2O$  abatement technology “N” (fraction of annual production that abatement technology is operating).

$P_{z,N}$  = Annual adipic acid production during which  $N_2O$  abatement technology “N” was used on unit “z” (ton adipic acid produced).

$P_z$  = Total annual adipic acid production from unit “z” (ton acid produced).

(f) You must determine the annual amount of adipic acid produced according to § 98.54(f).

(g) You must calculate  $N_2O$  emissions according to paragraph (g)(1), (2), (3), or (4) of this section for each adipic acid production unit.

(1) If one  $N_2O$  abatement technology “N” is located after your test point, you must use the emissions factor (determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation E-3a of this section:

$$E_{a,z} = \frac{EF_{N20,z} * P_z}{2205} * (1 - (DF * AF)) \quad (\text{Eq. E-3a})$$

Where:

$E_{a,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to this Equation E-3a (metric tons).

$EF_{N20,z}$  =  $N_2O$  emissions factor for unit “z” (lb  $N_2O$ /ton adipic acid produced).

$P_z$  = Annual adipic acid produced from unit “z” (tons).

$DF$  = Destruction efficiency of  $N_2O$  abatement technology “N” (percent of  $N_2O$  removed from vent stream).

$AF$  = Abatement utilization factor of  $N_2O$  abatement technology “N” (percent of time that the abatement technology is operating).

2205 = Conversion factor (lb/metric ton).

(2) If multiple  $N_2O$  abatement technologies are located in series after your test point, you must use the emissions factor (determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation E-3b of this section:

$$E_{b,z} = \frac{EF_{N20,z} * P_z}{2205} * (1 - (DF_1 * AF_1)) * (1 - (DF_2 * AF_2)) * \dots * (1 - (DF_N * AF_N)) \quad (\text{Eq. E-3b})$$

Where:

$E_{b,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to this Equation E-3b (metric tons).

$EF_{N20,z}$  =  $N_2O$  emissions factor for unit “z” (lb  $N_2O$ /ton adipic acid produced).

$P_z$  = Annual adipic acid produced from unit “z” (tons).

$DF_1$  = Destruction efficiency of  $N_2O$  abatement technology 1 (percent of  $N_2O$  removed from vent stream).

$AF_1$  = Abatement utilization factor of  $N_2O$  abatement technology 1 (percent of time that abatement technology 1 is operating).

$DF_2$  = Destruction efficiency of  $N_2O$  abatement technology 2 (percent of  $N_2O$  removed from vent stream).

$AF_2$  = Abatement utilization factor of  $N_2O$  abatement technology 2 (percent of time that abatement technology 2 is operating).

$DF_N$  = Destruction efficiency of  $N_2O$  abatement technology N (percent of  $N_2O$  removed from vent stream).

$AF_N$  = Abatement utilization factor of  $N_2O$  abatement technology N (percent of time that abatement technology N is operating).

2205 = Conversion factor (lb/metric ton).

N = Number of different  $N_2O$  abatement technologies.

(3) If multiple  $N_2O$  abatement technologies are located in parallel after your test point, you must use the emissions factor (determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation E-3c of this section:

$$E_{c,z} = \frac{EF_{N20,z} * P_z}{2205} * \sum_1^N ((1 - (DF_N * AF_N)) * FC_N) \quad (\text{Eq. E-3c})$$

Where:

$E_{c,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to this Equation E-3c (metric tons).

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$EF_{N_2O,z}$  =  $N_2O$  emissions factor for unit “z” (lb  $N_2O$ /ton adipic acid produced).

$P_z$  = Annual adipic acid produced from unit “z” (tons).

$DF_N$  = Destruction efficiency of  $N_2O$  abatement technology “N” (percent of  $N_2O$  removed from vent stream).

$AF_N$  = Abatement utilization factor of  $N_2O$  abatement technology “N” (percent of time that the abatement technology is operating).

$FC_N$  = Fraction control factor of  $N_2O$  abatement technology “N” (percent of total emissions from unit “z” that are sent to abatement technology “N”).

2205 = Conversion factor (lb/metric ton).

N = Number of different  $N_2O$  abatement technologies with a fraction control factor.

(4) If no  $N_2O$  abatement technologies are located after your test point, you must use the emissions factor (determined using Equation E-1 of this section) and the annual adipic acid pro-

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duction (determined in paragraph (f) of this section) according to Equation E-3d of this section for each adipic acid production unit.

$$E_{d,z} = \frac{EF_{N_2O} * P_z}{2205} \quad (\text{Eq. E-3d})$$

Where:

$E_{d,z}$  = Annual  $N_2O$  mass emissions from adipic acid production for unit “z” according to this Equation E-3d (metric tons).

$EF_{N_2O}$  =  $N_2O$  emissions factor for unit “z” (lb  $N_2O$ /ton adipic acid produced).

$P_z$  = Annual adipic acid produced from unit “z” (tons).

2205 = Conversion factor (lb/metric ton).

(h) You must determine the emissions for the facility by summing the unit level emissions according to Equation E-4 of this section.

$$N_2O = \sum_{z=1}^M E_{a,z} + E_{b,z} + E_{c,z} + E_{d,z} \quad (\text{Eq. E-4})$$

Where:

$E_{a,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to Equation E-3a of this section (metric tons).

$E_{b,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to Equation E-3b of this section (metric tons).

$E_{c,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to Equation E-3c of this section (metric tons).

$E_{d,z}$  = Annual  $N_2O$  mass emissions from adipic acid production unit “z” according to Equation E-3d of this section (metric tons).

M = Total number of adipic acid production units.

(i) You must determine the amount of process  $N_2O$  emissions that is sold or transferred off site (if applicable). You can determine the amount using existing process flow meters and  $N_2O$  analyzers.

[75 FR 66458, Oct. 28, 2010]

### § 98.54 Monitoring and QA/QC requirements.

(a) You must conduct a new performance test and calculate a new emis-

sions factor for each adipic acid production unit according to the frequency specified in paragraphs (a)(1) through (3) of this section.

(1) Conduct the performance test annually. The test must be conducted at a point during production that is representative of the average emissions rate from your process. You must document the methods used to determine the representative point.

(2) Conduct the performance test when your adipic acid production process is changed either by altering the ratio of cyclohexanone to cyclohexanol or by installing abatement equipment.

(3) If you requested Administrator approval for an alternative method of determining  $N_2O$  emissions under § 98.53(a)(2), you must conduct the performance test if your request has not been approved by the Administrator within 150 days of the end of the reporting year in which it was submitted.

(b) You must measure the  $N_2O$  concentration during the performance test using one of the methods in paragraphs (b)(1) through (b)(3) of this section.